MAR V. C. THE LINITED STATES PATENT AND TRADEMARK OFFICE

| | TEAT | | | | | | | | | | |
|---------|---|---|-------------|---|--|--|--|--|--|--|--|
| | pplication LRAJA, No.: | |))) | Examiner: S. H. Versteeg Art Unit: 1753 | | | | | | | |
| For: | | IONIZED AND CAPACITIVEL JTTERING | Y-COU | PLED PLASMA FOR SPUTTERING AND | | | | | | | |
| | | TRANSMITTAL OF INFOR | MATIO | N DISCLOSURE STATEMENT | | | | | | | |
| P.O. B | ox 1450 | for Patents A 22313-1450 | | | | | | | | | |
| Dear S | ir: | | | | | | | | | | |
| | In acco | rdance with 37 CFR 1.56, 1.97, | and 1.98 | , enclosed please find Form PTO-1449 listing the | | | | | | | |
| attache | d refere | nces which might be deemed man | terial to | the examination of the above-identified | | | | | | | |
| applica | ition. | | | | | | | | | | |
| A. | Non-E | nglish Language References | | | | | | | | | |
| | | Enclosed is a search report for a | a counter | rpart application. | | | | | | | |
| | | The search report Examiner has provided comments on the relevance of any non-English | | | | | | | | | |
| | language references cited in the search report. | | | | | | | | | | |
| | ts on the relevance of non-English language | | | | | | | | | | |
| | referen | ces. | | | | | | | | | |
| | | Set forth below are comments p | rovided | by the applicant's home country counsel on the | | | | | | | |
| | relevan | ce of non-English language refer | rences: | | | | | | | | |
| B. | The inf | ormation disclosure statement su | ıbmitted | herewith is being filed | | | | | | | |
| | | Within three months of the filin | g date of | f a national application or request for continued | | | | | | | |
| | examination under 37 CFR 1.114. | | | | | | | | | | |
| | | Within three months of the date of entry into the national stage as set forth in 37 CFR | | | | | | | | | |
| | 1.491 in an international application. | | | | | | | | | | |
| | | Before the mailing date of a firs | t Office | Action on the merits. | | | | | | | |
| | | Before the mailing date of a first | t Office | Action after filing of a request for continued | | | | | | | |
| | examin | ation. | | | | | | | | | |

03/22/2007 AADDF01 00000009 10632882

01 FC:1806

180.00 OP

- C. The information disclosure statement submitted herewith is being filed after the period specified in paragraph B, but before the mailing date of a final action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or any other action otherwise closing prosecution, and is accompanied by:
 - □ A statement under 37 CFR 1.97(e); or
 - A fee of \$180 as set forth in 37 CFR 1.17(p).
- D. The information disclosure statement submitted herewith is being filed after the period specified in paragraph C, but before payment of the issue fee, and is accompanied by:
 - □ A statement under 37 CFR 1.97(e); and
 - \Box A fee of \$180 as set forth in 37 CFR 1.17(p).

STATEMENT UNDER 37 CFR 1.97(e)

- I, the person signing below, certify:
- That each item of information contained in the information disclosure statement submitted herewith was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the statement (37 CFR 1.97(e)(1)).
- That no item of information contained in the information disclosure statement submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the statement (37 CFR 1.97(e)(2)).

- continued -

06775USA 7828.7082

If a fee is required under paragraph B or C supra, enclosed is Applicant's check in the amount of \$180 as set forth in 37 CFR 1.17(p). The Commissioner is authorized to charge any insufficiency or credit any overpayment related to this paper to Deposit Account 50-0585.

The Examiner is invited to contact the undersigned with any questions in this regard.

Respectfully submitted,

19 March 2007

(Date)

William K. Konrad, Reg. No. 28,868

KONRAD RAYNES & VICTOR, LLP 315 South Beverly Drive, Suite 210 Beverly Hills, California 90212

(310) 553-7970

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date indicated above and is addressed to: Complissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

March 19, 2007

(Date)

| | | | \mathcal{L}_{-} | _ | | | ~ ~ \ ~ ~ \ | L | | | | | | | |
|----------------------------------|--|---|-------------------|-------------|------|------|------------------------------|----------------|-------------|---|-------------|----------------------|-------------|---------|--|
| FORM PTO- | 1449 | MAR 2.2 7007 Docket Number (Optional) Application Num 006775USA MATION DISCLOSUS CITATION | | Number | , | | | | | | | | | | |
| INFO | RMA | TIO IN A | N É | /bb Jec | FIE | SU | ION | CITATION | | Applicant GOPALRAJA et al. | , | | | | |
| (Use several sheets if necessary | | | | | ıry) | | Filing Date July 31, 2003 | | Group Art U | nit | | | | | |
| | | | | | | | | U.S. PATE | NT E | OCUMENTS | | | | _ | |
| EXAMINER INITIAL | DOCUMENT NUMBER | | | | | | | DATE | NAME CLASS | | | SUBCLASS FILING DATE | | | |
| | 6 | 6 | 1 | 0 | 1 | 8 | 4 | 8/26/03 | Ding | g, et al. | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | FC | REIGN PA | TEN | T DOCUMENTS | | | | | |
| | DOCUMENT | | | IENT NUMBER | | | | DATE | | COUNTRY | CLASS | SUBCLASS | Translation | | |
| | | | | | | | | : | | | | | YES | NO | |
| | 03 | 0 | 4 | 2 | 4 | 2 | 4 | 5/22/03 | PCI | - | | | | | |
| | | | | | | | | | <u> </u> | | | , | | | |
| | | | | | | | | | | | | | | | |
| | | | ОТІ | IER | DOC | UN | IENT | S (Including | Autho | or, Title, Date, Pertir | ent Pages | , Etc.) | | | |
| | US- | 2005 | 5-02 | 5569 | 1 pu | b. 1 | 1-17- | 2005 (atty dkt | t 0709 | 4C) | | | | | |
| | Apblett, C., et al. "Silicon nitride growth in a high-density plasma system," Solid State Technology, Nov. 1995, pp 73 - 80. | | | | | | | | | | | | | | |
| | Bader, H.P., et al. "Planarization by radio-frequency bias sputtering of aluminum as studied experimentally and by computer simulation," J. Vac. Sci. Technol. A., Nov/Dec 1985, pp 2167 - 2171. | | | | | | | | | | | | | | |
| | | | | | | | | | | semiconductor trend r 1995, pp 203 - 208 | | s using ionized | magnet | ron | |
| | | | | | | | | | | cyclotron resonance chnol.B 12(1), Jan/Fe | | | nanent | | |
| | | | | | | | | | | ermanent magnet ele chnol. B, Vol. 14, No. | | | | | |
| | | | | | | | | | | profiles under ionize 95, pp 183 - 191. | d magnetro | on sputter meta | l deposi | tion," | |
| | | | | | | | per de 2909 | | lectro | n cyclotron resonanc | e plasma," | J. Vac. Sci. Te | chnol. A | 11(6), | |
| | | | | | | | | | inum | by RF/DC sputtering | with RF bia | as," J. Electrocl | nem. So | c. Vol. | |
| | lvanov, I., et al. "Electron energy distribution function in a DC magnetron sputtering discharge," Vacuum, Vol. 43, No. 8, 1992, pp 837-84,. | | | | | | | Vol. | | | | | | | |
| | Kidd, P. "A magnetically confined and electron cyclotron resonance heated plasma machine for coating and ion surface modification use," J. Vac. Sci. Technol. A, Vol. 9, No. 3, May/Jun 1991, pp 466 - 473 | | | | | | | | nd ion | | | | | | |

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

| | Kitamoto, Y., et al. "Compact sputtering apparatus for depositing Co-Cr alloy thin films in magnetic disks," Proc Of the 4th ISSP (Kanazawa, 1997), pp 518 - 522. | | | | | | | | |
|---|---|--|--|--|--|--|--|--|--|
| | Klawuhn, E., et al. "Ionized physical-vapor deposition using a hollow-cathode magnetron source for advanced metallization," J. Vac. Sci. Technol. A 18(\$), Jul/Aug 2000, pp 1546 - 1549. | | | | | | | | |
| _ | Kochel, L.J. "Pressure control of RF bias for sputtering," Rev. Sci. Instrum., Vol. 47, No. 12, Dec. 1976, pp 1556 - 1557. | | | | | | | | |
| | Koenig, H., et al. "RF sputtering system with variable substrate bias," IBM Techn. Discl. Bulletin Vol. 13, No. 2 (July 1970), pp 323 - 324. | | | | | | | | |
| | Kotani, H., et al. "Sputter-etching planarization for multilevel metallization," J. Electrochem. Soc.: Solid-State Science and Technology, Vol. 130, No. 3., March 1983, pp 645 - 648. | | | | | | | | |
| | Matsuo, S. "Reactive ion-beam etching and plasma deposition techniques using electron cyclotron resonance plasmas," Academic Press, Inc. , 1983, pp 76 - 117. | | | | | | | | |
| | Matsuoka, M., et al. "Dense plasma production and film deposition by new high-rate sputtering using an electric mirror," J. Vac. Sci. Technol. A, Vol. 7, No. 4, Jul/Aug 1989, pp 2652 - 2657. | | | | | | | | |
| | Musil, J., et al., "Unbalanced magnetrons and new sputtering systems with enhanced plasma ionization," J. Vac. Sci. Technol. A, Vol. 9 No. 3, May/Jun 1991, pp 1171 - 1177. | | | | | | | | |
| | Nender, C., et al. "High bias sputtering for large-area selective deposition," Thin Solid Films 228 (1993) May 15 Nos.1-2, pp 87 - 90. | | | | | | | | |
| | Park, I.S., et al. "A novel Al-reflow process using surface modification by the ECR plasma treatment and its application to the 256Mbit DRAM," IEEE 1994, pp 109 - 112. | | | | | | | | |
| | Rossnagel, S.M. "Collimated magnetron sputter deposition with grazing angle ion bombardment," J. Vac. Sci. Technol. A 13(1), Jan/Feb 1995, pp 156 - 158. | | | | | | | | |
| | Samukawa, S., "Wave propagation and plasma uniformity in an electron cyclotron resonance plasma," J. Vac. Sci. Technol. A 11(5), Sep/Oct 1993, pp 2572 - 2576. | | | | | | | | |
| | Skelly, D. W., et al. "Significant improvement in step coverage using bias sputtered aluminum," J. Vac. Sci. Technol. A 4(3), May/Jun 1986, pp 457 - 460. | | | | | | | | |
| | Suzuki, K., et al. "Microwave plasma etching," unknown pub., Vol. 34, No. 10, 1984, pp 953-957. | | | | | | | | |
| | Suzuki, K., et al. "Microwave plasma etching," Japanese J. Applied Physics, Vol. 16, No. 11, Nov 1977, pp 1979-1984. | | | | | | | | |
| | Wada, J., et al. "Cu dual damascene process fo 0.13µm technology generation using self ion sputtering (SIS) with ion reflector," IEEE 2000, pp 108 - 110. | | | | | | | | |
| | Yamashita, M. "Fundamental characteristics of built-in high-frequency coil-type sputtering apparatus," J. Vac. Sci. Technol. A, Vol. 7, No. 2, Mar/Apr 1989, pp 151 - 158. | | | | | | | | |
| | Yasui, T., et al. "Electron cyclotron resonance plasma generation using a planar ring-cusp magnetic field and a reentrant coaxial cavity," J. Vac. Sci. Technol. A 13(4), Jul/Aug 1995, pp 2105 - 2109. | | | | | | | | |
| | Yamazato, M., et al. "Preparation of TiN thin films by facing targets magnetron sputtering," Proc. Of the 4th ISSF (Kanazawa, 1997), pp 634 - 638. | | | | | | | | |
| | Anon. "Endpoint detection method for ion etching of material having a titanium nitride underlayer," Research Disclosure, Feb 1991, No. 322, 1 pg. | | | | | | | | |
| | Novellus Systems, Inc. "Damascus: 12 Steps of Damascus," webpages printed 1998, 14 pp. | | | | | | | | |
| | "SypherLine by MTi," advertisement, Semiconductor International, Nov. 1985; 4 pp. | | | | | | | | |
| | "Applications Note, MTi," internal and/or marketing document, Vol. 1, No.1, April 1986, 4 pp. | | | | | | | | |

March 19, 2007 Sheet 2 of 2

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.